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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/379,702	08/24/99	OHTANI H	07977/093002

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MM91/1025

EXAMINER	
LEE, E	
ART UNIT	**PAPER NUMBER**
2815	

DATE MAILED: 10/25/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/379,702	OHTANI ET AL.	
	Examiner	Art Unit	
	Eugene Lee	2815	

-- The MAILING DATE of this communication appears on the cover sh et with the corr spond nce addr ss --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

1)☒ Responsive to communication(s) filed on *24 August 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 August 1999* is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☒ All b)☐ Some * c)☐ None of the CERTIFIED copies of the priority documents have been:

1.☐ received.

2.☒ received in Application No. (Series Code / Serial Number) *08/757,112* .

3.☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to because in FIG. 1D, label 108 should be label 104. Correction is required.

Specification

2. The disclosure is objected to because of the following informalities: the abbreviation "AFM", first mentioned on page 9, line 7, should be identified at least once in the disclosure. Appropriate correction is required.

Claim Objections

3. Claim 16 is objected to because of the following informalities: the word "wet" is spelled incorrectly on line 2 of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 2, 3 and 5 thru 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al. '541. See, for example, FIG. 4E. Yamazaki discloses an insulating substrate

201, crystalline silicon film 208, silicon oxide film 209, gate electrode 210, source 212, drain 210, and channel region.

a. Regarding claims mentioning the size of the ridges as less than 500 angstroms, Yamazaki discloses the silicon film 203 as having a thickness as low as 500 angstroms (see column 7, line 55). Therefore, the possible size of the ridges formed on such a film must necessarily be much smaller than the above stated size (i.e. 500 angstroms).

b. Regarding claims mentioning the size of the ridges as less than 200 angstroms, see below as described in numeral 8a.

c. Regarding claims mentioning AFM, the Office considers it inconsequential what device *measures* the dimensional properties of a structure. As long as the structure possesses those properties, the device that measures those properties does not add any structural limitations to the final product. Therefore, any language relating to the how the dimensional properties of a product are determined without adding any additional limitations to the *product itself* is given no patentable weight.

Product-by-Process Limitations

While not objectionable, the Office reminds Applicant that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of

the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. Note that applicant has the burden of proof in such cases, as the above case law makes clear. Thus, no patentable weight will be given to those process steps which do not add structural limitations to the final product.

This discussion is relevant to the present claims, particularly claims 6, 7, 9, 12, 13, 15, 16, 19, 20, 22, 25, 26, 28, 29, 34, 38, 39, 43 and 44, since these claims include language that merely recite a process. For example, in claim 6, language such as "by irradiating a laser light to said semiconductor layer" does not further limit the final product. The patentability of the final product is not determined by the methods used to create that product and, thus, the language relating to the processing methods is given no patentable weight.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. '541 as applied to claims 1 thru 3 and 5 thru 30 above, and further in view of Lee '320. Yamazaki does not disclose the thin film transistor as having lightly doped regions. However, Lee does show a thin film transistor these regions. See, for example, figure 3 and label 42c. It

would have been obvious to one of ordinary skill in the art at the time of invention to include these lightly doped regions in Yamazaki's invention in order to weaken the electric field around the gate and source/drain regions. See, for example, column 1, line 51.

8. Claims 35 thru 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. '541 as applied to claims 1 thru 3 and 5 thru 30 above, and further in view of Kusumoto et al. '960. Yamazaki does not disclose the purpose of the insulating layer on the semiconductor layer as suppressing the formation of ridges. However, Kusumoto states in column 5, line 60, that a silicon oxide film (capping layer) formed over a silicon substrate functions to prevent the ridge formation on the surface of a silicon film during laser annealing. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to know that the silicon oxide film used in applicant's invention has a function (besides serving as the gate insulating film) to suppress the formation of ridges on a silicon film, for example.

a. Regarding claims mentioning the size of the ridges as less than 200 angstroms, the applicant's disclosure admits (see, page 9, line 7) that when a capping layer is applied, the size of the ridges is less than 200 angstroms. Kusumoto utilizes a capping layer in his invention in the same manner as the applicant (a silicon oxide film on a silicon substrate) as described above.

9. Claims 31 thru 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. '541 and Kusumoto et al. '960 as applied to claims 35 thru 44 above, and further in view of Wolf (Silicon Processing). The previously cited references do not teach the insulating layer as silicon nitride. However, Wolf states that silicon nitride is a strong insulative material that is impermeable to moisture and mobile impurities (see, for example, p. 274, second

paragraph). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to substitute silicon nitride as the insulating layer since it forms a barrier to moisture and mobile impurities.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mahshid Saadat can be reached on 703-308-4915. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Eugene Lee
October 22, 2000

Mahshid Saadat
Mahshid Saadat
Supervisory Patent Examiner
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